NORTH MARIN WATER DISTRICT

2010 URBAN WATER MANAGEMENT PLAN

June 2011

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SECTION 1
INTRODUCTION

This Urban Water Management Plan (Plan) addresses the North Marin Water District (District) water system and includes a description of the water supply sources, magnitudes of historical and projected water use, and a comparison of water supply to water demands during normal, single-dry, and multiple-dry years. The District receives the majority (~80%) of its water from Sonoma County Water Agency (Agency), which provides water principally from the Russian River to several retail water contractors, primarily in Sonoma County, California. The remainder of the District's water supply is from its local Stafford Lake water supply and a small amount of recycled water developed in cooperation with Novato Sanitary District.

This section provides background information on the Plan, an overview of coordination with other agencies, and a description of public participation and Plan adoption.

1.1 Urban Water Management Planning Act

The District plan has been prepared in accordance with the Urban Water Management Act (Act). The Act is defined by the California Water Code, Division 6, Part 2.6, and Sections 10610 through 10656. The Act requires every urban water supplier that provides water for municipal purposes to more than 3,000 connections or supplying more than 3,000 ac-ft of water annually, to adopt and submit a plan every five years to the California Department of Water Resources (DWR). The Act was most recently amended in November 2009 with the adoption of Senate Bill (SB) x7-7. The most significant revision is the requirement for establishing per capita water use targets and an option to delay Plan adoption to July 1, 2011. This plan serves as a long-range planning document for the District's water supply.

1.2 Resource Maximization and Import Minimization

Water management tools have been used by the District to maximize local Stafford Lake water resources, expand the development and use of Recycled Water and implement water conservation measures including participating with the Agency in regional water conservation efforts.

1.3 Coordination

The District has implemented its 2005 plan in accordance with the schedule set forth in that plan. The Act requires the District to coordinate the preparation of its Plan with other appropriate agencies in the area, including other water suppliers that share a common source, water management agencies, and relevant public agencies. The District coordinated the preparation of its Plan with its wholesale water supplier, the Agency, other water contractors that receive water from the Agency, the City of Novato, the Novato Sanitary District, the Las Gallinas Valley Sanitary District, the County of Marin and County of Sonoma. On February 24, 2011, a letter was sent to each of these entities advising that NMWD was reviewing and updated the UWMP. In addition, the District reviewed the Marin County General Plan demographic projections in development of the water demand projections in this Plan. Table 1-1 provides a summary of the District's coordination with the appropriate agencies.

Table 1-1 (DWR Table 1)
Coordination with appropriate agencies

Coordinating Agencies[1,2]	Participated in developing the plan	Commented on the draft	Attended public meetings	Was contacted for assistance	Was sent a copy of the draft plan	Was sent a notice of intention to adopt	Not involved / No information
Sonoma County Water Agency	x	x		x			
Novato Sanitary District				x			
Las Gallinas Valley Sanitary District				x			
Marin County LAFCO				x			
Marin Municipal Water District	x			x			
County of Marin				x			
City of Novato				x			
City of Sonoma	x			x			
City of Santa Rosa	x			x			
City of Rohnert Park	x			x			
City of Cotati	x			x			
City of Petaluma	x			x			
Town of Windsor	x			x			
Valley of the Moon Water District	x			x			
County of Sonoma PRMD				x			
General public			x		x	X	
Other							

[1] *Indicate the specific name of the agency with which coordination or outreach occurred.*

[2] *Check at least one box in each row.*

1.4 Public Participation and Plan Adoption

The District encouraged community and public interest involvement in the Plan update through public hearing and inspection of the draft document. Public hearing notifications were published in the Novato Advance on June 8 and June 15, 2011. A copy of the published Notice of Public Hearing is included in Appendix A. The hearing provided an opportunity for all residents and employees in the service area to learn and ask questions about their water supply in addition to the District's plans for providing a reliable, safe, high-quality water supply. Copies of the draft Plan were made available for public inspection on the District's website, at the District's Administration Building and at the local Novato public library. Copies of the notices, advertisements, and outreach lists are provided in Appendix A.

One comment from the Agency was received on the draft Plan and has been addressed in Section 4.1.3.

This Plan was adopted by the District's Board of Directors on June 21, 2011 and is available to view or download on the District's website http://www.nmwd.com and at the District Administrative Building. A copy of the Final 2010 UWMP will be submitted to DWR, California State Library and the Agency, no later than 30 days after adoption by the District Board of Directors. A copy of the adopted resolution is provided in Appendix A.

1.5 Plan Organization

Section 1 provides a summary of the sections in the Plan. Section 2 provides a description of the service area, climate, water supply facilities, and distribution system. Section 3 presents historical and projected water use. Section 4 describes water supplies including recycled water. Section 5 addresses water supply reliability including a comparison of future water supply to demand and water shortage contingency planning. Section 6 provides a summary of water conservation and Demand Management Measures. Appendices A through D provide relevant supporting documents.

DWR has provided a checklist of the items that must be addressed in each Plan based upon the Act. This checklist makes it simple to identify exactly where in the plan each item has been addressed. The checklist is completed for this Plan and provided in Appendix D. It references the sections and page numbers where the specific items can be found. The tables that are recommended by DWR are identified in this Plan with their applicable DWR table number (DWR, 2011).

SECTION 2
SYSTEM DESCRIPTION

This section describes the District's water system, including a description of the service area and its climate, and the water system facilities, including surface water supply facilities and the distribution system.

2.1 Description of Service Area

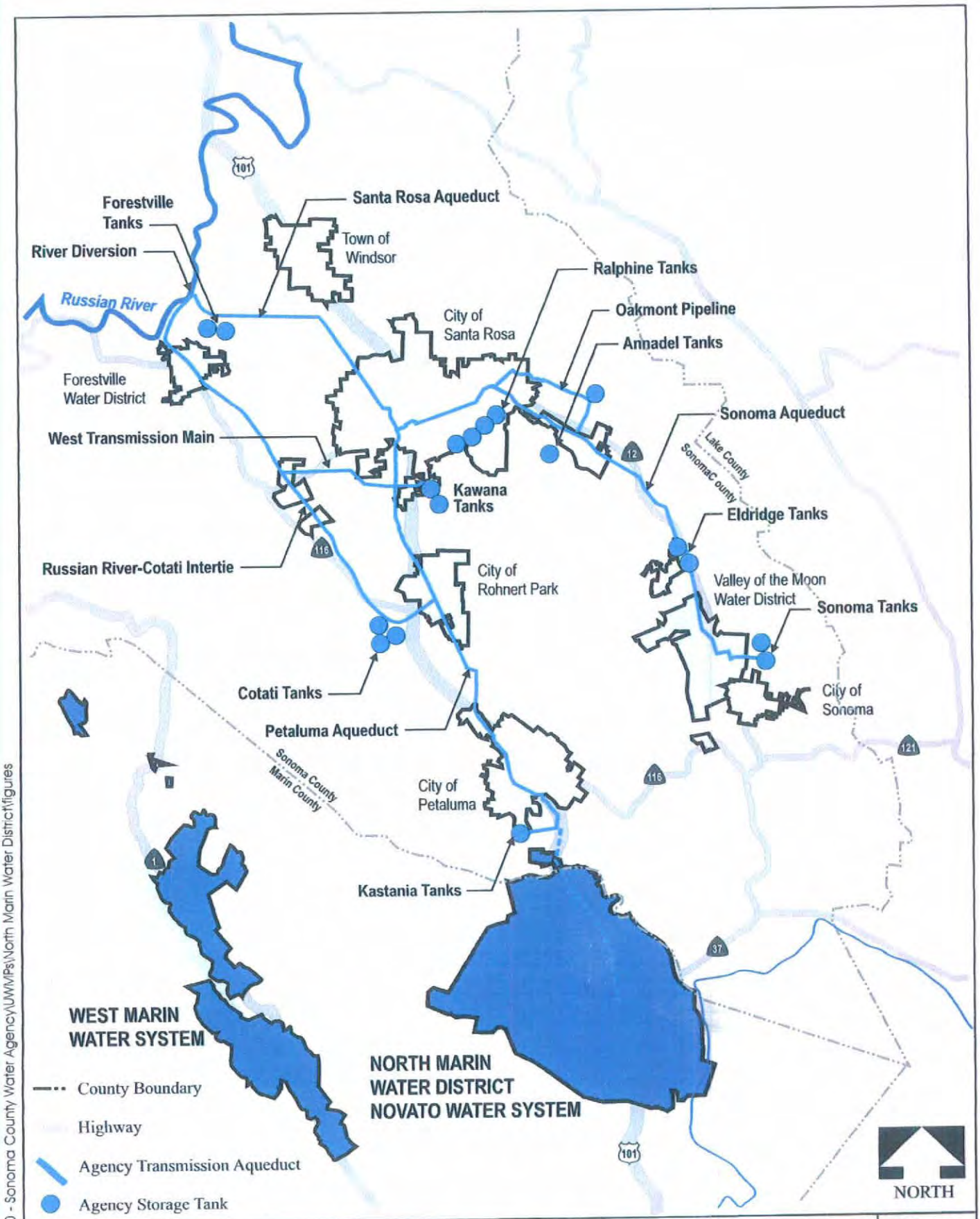
The District provides potable water to a total population of approximately 60,423 people in the Novato service territory in Marin County, just south of the Sonoma County border. The Novato Water System serves primarily the City of Novato and surrounding unincorporated areas. (Novato Water System Master Plan, 2007). Figure 2-1 identifies the District's Novato Water System service area and the Agency's transmission system. The Novato Water System only is addressed in this plan. The District's West Marin Water System has a separate source of supply and there is no physical interconnection of water facilities between the Novato and West Marin Water System. The West Marin Water System has only 770 connections, serving ~1800 people, and is not subject to the Act.

2.2 Climate

The District's climate is tempered by its proximity to the Pacific Ocean. In common with much of the California coastal area, the year is divided into wet and dry seasons. Approximately 93 percent of the annual precipitation normally falls during the wet season, October to May, with a large percentage of the rainfall typically occurring during three or four major winter storms. Winters are cool, and below-freezing temperatures seldom occur. Summers are warm and the frost-free season is fairly long. Annual precipitation averages 29.6 inches. Table 2-1 summarizes average monthly evapotranspiration rates (ETo), rainfall, and temperatures.

2.3 Water Supply Facilities

The District receives the majority of its water supply from the Agency. Additional details regarding sources of water supply including Recycled Water are included in Section 4.



	PROJECT	SITE: UWMP 2010, North Marin Water District	Figure 2-1
	DATE: 3/6/06	TITLE: North Marin Water District Service Area	

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Table 2-1 - Climate

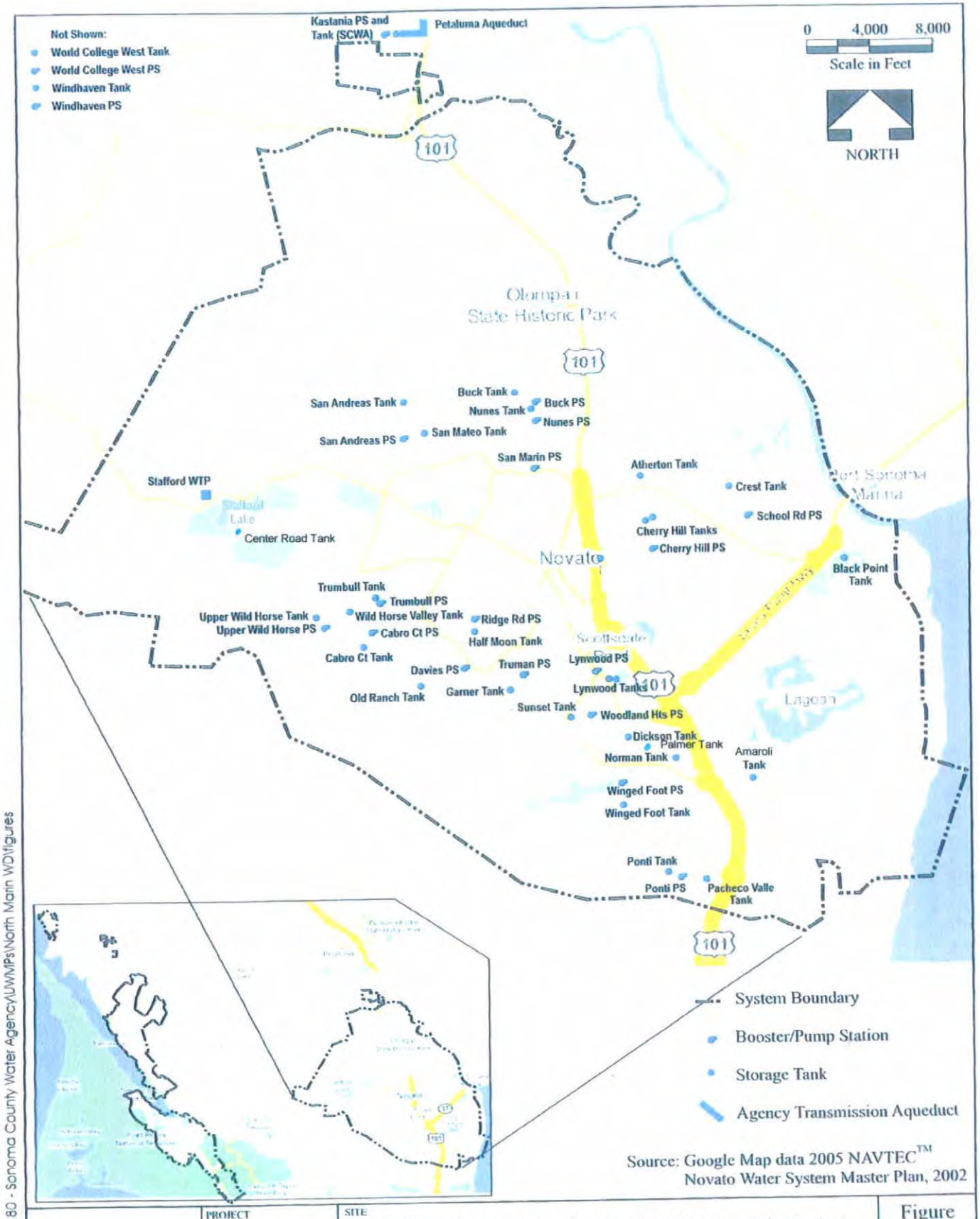
	Standard average ETo[a], in	Average rainfall[b], in	Average temperature[b], °F
January	1.09	6.44	47.23
February	1.66	5.26	51.27
March	2.95	3.89	53.56
April	4.17	1.83	56.56
May	5.17	0.69	61.48
June	6.15	0.25	67.07
July	6.64	0.03	70.10
August	5.83	0.11	69.80
September	4.34	0.31	68.06
October	2.81	1.58	62.23
November	1.26	4.03	53.14
December	0.93	5.20	47.33
Annual	43.00	29.63	58.95

Notes:
[a] Data represents the monthly average from July 1986 to January 2002 and was recorded from Novato CIMIS station 63.
ETo, or evapotranspiration, is the loss of water from evaporation and transpiration from plants.
[b] 1952-2005 data recorded at Sonoma station from NOAA website www.wrcc.dri.edu

2.3.1 Surface Water System Facilities

The District receives the majority of its water supply from the Agency's Russian River Project. The Santa Rosa Aqueduct and the Russian River-Cotati Intertie carry primarily Russian River water from the Agency diversion facilities located in the Wohler and Mirabel areas to the District via the Petaluma and North Marin Aqueducts. In addition, the Agency operates three groundwater wells in the Santa Rosa Plain that supplement the water supply from the Russian River.

The District's Novato Water System maintains a local source of supply, Stafford Lake, in addition to the water purchased from the Agency. The District operates its Stafford Lake source seasonally to reduce peak demand on the Agency's Aqueduct system. A map of the District's Novato water system is presented in Figure 2-2. The District's water supply from Stafford Lake is treated at the Stafford Treatment Plant (STP). Water from Stafford Lake is drawn through an intake tower and, depending on the water surface elevation, is either gravity-fed or pumped to the STP. The STP, which was constructed in 1951, was upgraded in 1973 and completely rehabilitated in 2006. The rehabilitated STP uses chlorine dioxide as a pre-oxidant followed by Actifloc ballasted flocculation with conventional filtration, chlorination and pH adjustment (sodium hydroxide addition) and has a design capacity of 6 mgd).



Source: Google Map data 2005 NAVTEC™
Novato Water System Master Plan, 2002

PROJECT	SITE	Figure
	UWMP 2010, North Marin Water District	2-2
DATE 3/6/06	TITLE Novato Water System, Water System Facilities	

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2.3.2 Groundwater Facilities

The District's Novato Water System has no developed groundwater supply source.

2.4 Distribution System

The District receives water from Stafford Lake and the Agency's Petaluma Aqueduct. The District owns and operates the 30-inch diameter North Marin Aqueduct that transports water from the Agency's Petaluma Aqueduct near Kastania Tank and Pump Station in south Petaluma to Novato. The District has four separate pressure zones, using 29 storage tanks, 26 booster pump stations, and seven hydropneumatic systems that have combined storage and pump stations.

2.4.1 Storage

The District maintains extensive water storage facilities due to its distance from Agency storage facilities. The District's four pressure zones each have gravity storage in one or more storage tanks. A total of 29 storage facilities are located throughout the Novato Water System with a total capacity of 34 million gallons. Approximately 48 percent of the total system demand is in Zone 1 and 43 percent in Zone 2. Tank locations and specifications are summarized in Tables 2-2 and 2-3.

Table 2-2 Water Storage Facilities

Zone	Storage Tanks	Capacity (gallons)	Type of construction	Year built
1	Lynwood 1	500,000	Welded Steel	1958
1	Lynwood 2	850,000	Welded Steel	1963
1	Palmer	3,000,000	Welded Steel	2008
1	Atherton	5,000,000	Welded Steel	1973
1	Amaroli	4,500,000	Concrete	2002
	Total Zone 1	13,850,000		
2	Sunset	5,000,000	Welded Steel	1963
2	Trumbull	1,500,000	Welded Steel	1963
2	San Mateo	5,000,000	Welded Steel	1966
2	Crest	500,000	Welded Steel	1966
2	Pacheco (a)	5,000,000	Concrete	1975
2	Black Point	324,000	Welded Steel	2000
2	Air Base	1,000,000	Welded Steel	1957
	Total Zone 2	18,324,000		
3	Ponti	500,000	Welded Steel	1976
3	Cherry Hill 2	200,000	Welded Steel	1997
3	Cherry Hill 1	250,000	Welded Steel	1979
3	Garner	100,000	Welded Steel	1986
3	Half Moon	100,000	Welded Steel	1969
3	Wild Horse Valley	500,000	Welded Steel	1966
3	Center Road	500,000	Welded Steel	2008
3	Winged Foot	600,000	Welded Steel	1964
3	San Andreas	250,000	Welded Steel	1985
3	World College West	200,000	Welded Steel	1982
3	Dickson	250,000	Welded Steel	1988
3	Nunes	120,000	Welded Steel	1994
3	Old Ranch Road	50,000	Redwood	1963
3	Windhaven	8,000	Concrete	1991
	Total Zone 3	3,268,000		
4	Upper Wild Horse	44,000	Bolted Steel	1987
4	Buck	500,000	Welded Steel	1997
4	Cabro Court	5,500	Concrete	2001
	Total Zone 4	549,500		
Other-Kastania (SCWA)		12,000,000		

Table 2-3 Hydropneumatic Tank Systems

Hydropneumatic System	Tank Size (Gallons)	Year Built
Hayden	3,500[a]	1963
Eagle Drive	4,000[a]	1959
Bahia	3,000	1970
San Marin East	3,000	1980
Indian Hills	6,000	1982
Diablo	1,500	1985
Garner	4,200	1985
Total	17,700	

Note:
[a]Two tanks at these sites.

2.4.2 Pump Stations

The District's water distribution system, serving the greater Novato area, is divided into four pressure zones. Zone 1, at the lowest elevation, is supplied by water delivered from the Agency via the Petaluma Aqueduct and the North Marin Aqueduct, as well as water pumped from Stafford Lake Water Treatment Plant. Water to supply the other zones is pumped from Zone 1. Transmission mains vary in size from 16 to 24 inches in diameter. Table 2-4 summarizes the characteristics of the District's pump stations.

Table 2-4 Novato Water System Active Pump Stations

From Zone	To Zone	Location	No. of Pumps	HP	Pump Capacity (gpm)
1	2	San Marin	3	100-100-100	1,800
1	2	Lynwood	3	100-100-100	1,800
1	2	School Road	2	30-30	400
1	2	Hayden[a]	2	5.0-5.0	75
1	2	Hancock	1	1.0	35
1	3	Cherry Hill	2	15-15	140
1	2	Diablo Hills[a]	2	3.0-5.0	50
2	3	Davies	2	5.0-5.0	50
2	3	Ridge Road	2	5.0-5.0	80
2	3	Truman	2	7.5-7.5	75
2	3	Winged Foot	2	15-15	150
2	3	Ponti	2	15-15	250
2	3	Trumbull	3	15-15-15	200
2	3	San Andreas	2	10.0-10.0	110
2	3	Eagle Drive[a]	2	10.0-10.0	245
2	3	Bahia[a]	2	7.5-7.5	125
2	3	San Marin East[a]	2	5.0-5.0	80
2	3	Indian Hills[a]	2	7.5-7.5	125
2	3	Nunes	2	5.0-5.0	110
2	3	Woodland Hts	2	7.5-7.5	110
3	4	Garner[a]	2	5.0-5.0	50
3	4	Cabro Ct	1	1.5	25
3	4	Wild Horse Dr	2	3.0-3.0	50
3	4	Buck	2	5.0-5.0	100
Aqueduct	3	Wind Haven	2	1.5-1.5	25
Aqueduct	3	World College West	2	10.0-10.0	100
Aqueduct	1	Kastania	2	250-400	11,000 – 14,000

[a]Hydropneumatic systems

2.4.3 Distribution Pipelines

Most of the District's distribution pipelines range from 6 to 12 inches in diameter, constructed of asbestos cement or polyvinyl chloride, and are up to 50 years old.

2.5 Employment, Land Use, and Population

This section describes the District's employment and land use characteristics and current and projected future population.

2.5.1 Employment Characteristics

The District's employment is primarily in the private sector and in the service industries. Regionally, employment in the agricultural industry is related to vineyards, livestock, orchards, silage crops, and timber. The primary industrial activities in the region include: biochemical production and other high technology, limited wine production, other agricultural product processing, and miscellaneous manufacturing. Recreation and tourism are small but growing industries in the region (Sonoma County Water Agency, 2000).

2.5.2 Land Use Characteristics

Land use within the District is primarily residential, but also includes agricultural, industrial, commercial, and recreational land uses.

2.5.3 Population Projections

Table 2-5 provides the current and projected population for the District's service area through the year 2035. The population projection analysis is provided in Appendix B.

Table 2-5 (DWR Table 2)
Population — current and projected

	2010	2015	2020	2025	2030	2035 - optional	Data source[2]
Service area population[1]	60,423	62,589	64,804	66,272	67,626	67,808	ABAG

1 Service area population is defined as the population served by the distribution system. See Technical Methodology 2: Service Area Population (2010 UWMP Guidebook, Section M).

2 Provide the source of the population data provided. Average ABAG data by Census Tract from years 2005, 2007 and 2009.

SECTION 3
SYSTEM DEMANDS

This section of the Urban Water Management Plan (UWMP) presents the actual and projected number of water accounts and annual water use in 5-year increments between 2005 and 2035. The analysis prepared by Maddaus Water Management (MWM) using the Decision Support System Model, is included in Appendix B. Similar analyses were prepared by MWM for all other Agency Water Contractors.

3.1 Baselines and Targets

One of the new requirements for completing an UWMP in 2010 under Senate Bill x 7-7 (SBx7-7), the Water Conservation Act of 2009, is the requirement for each urban water supplier to develop a baseline daily per capita water use, establish a per capita water use target for 2020, and an interim water use target for 2015.

3.1.1 Base Daily Per Capita Water Use

The base daily per capita water use is the water supplier's average gross daily water use per capita measured in gallons. The baseline includes all water entering the delivery system, including water losses, except for recycled water delivered within the supplier's service area, water placed into long-term storage, or water conveyed to other urban water suppliers.

The purpose of developing a base daily per capita water use figure is to have a baseline from which to derive the 2015 and 2020 water use targets. The baseline water use is developed for each water supplier based on a 10-year average beginning no earlier than 1994 and ending no later than 2010. In some circumstances, water suppliers may use 15-year or 5-year averages.

For the development of the District's base daily per capita water use, a 10-year average was used which is based on data from 1995 to 2004.

Table 3-1 (DWR Table 13)
Base period ranges

Base	Parameter	Value	Units
10- to 15-year base period	2008 total water deliveries	10,203	*see below*
	2008 total volume of delivered recycled water	144	*see below*
	2008 recycled water as a percent of total deliveries	1.40%	percent
	Number of years in base period[1]	10	years
	Year beginning base period range	1995	
	Year ending base period range[2]	2004	
5-year base period	Number of years in base period	5	years
	Year beginning base period range	2003	
	Year ending base period range[3]	2007	

Units (circle one): ***acre-feet per year*** *million gallons per year* *cubic feet per year*

[1] *If the 2008 recycled water percent is less than 10 percent, then the first base period is a continuous 10-year period. If the amount of recycled water delivered in 2008 is 10 percent or greater, the first base period is a continuous 10- to 15-year period.*

[2] *The ending year must be between December 31, 2004 and December 31, 2010.*

[3] *The ending year must be between December 31, 2007 and December 31, 2010.*

As shown in Table 3-2 (DWR Table 14), the base daily per capita water use is 178 gallons per capita per day (GPCD). The base daily per capita water use was developed using the total service area population. The gross water use includes all water entering the water delivery system, including water losses.

Table 3-2 (DWR Table 14) Base daily per capita water use — 10- to 15-year range				
Base period year		Distribution System Population	Daily system gross water use (mgd)	Annual daily per capita water use (gpcd)
Sequence Year	Calendar Year			
Year 1	1995	50,157	8.73	174
Year 2	1996	50,097	9.20	184
Year 3	1997	50,185	9.41	187
Year 4	1998	50,219	8.23	164
Year 5	1999	51,015	9.10	178
Year 6	2000	52,108	9.60	184
Year 7	2001	52,709	9.79	186
Year 8	2002	55,651	9.86	177
Year 9	2003	55,794	9.51	170
Year 10	2004	56,989	10.24	180
			Base Daily Per Capita Water Use[1]	178

[1] *Add the values in the column and divided by the number of rows.*

As shown in Table 3-3 (DWR Table 15), the 5-year base daily per capita water use is 162 gpcd. The 2020 water use target established in Section 3.1.2.1 must be less than or equal to this 5-year baseline.

Table 3-3 (DWR Table 15) Base daily per capita water use — 5-year range				
Base period year		Distribution System Population	Daily system gross water use (mgd)	Annual daily per capita water use (gpcd)
Sequence Year	Calendar Year			
Year 1	2003	55,794	9.51	170
Year 2	2004	56,989	10.24	180
Year 3	2005	59,359	8.98	151
Year 4	2006	60,797	9.58	158
Year 5	2007	60,942	9.22	151
			Base Daily Per Capita Water Use[1]	162

[1] *Add the values in the column and divided by the number of rows*

3.1.2 Water Use Targets (2015, 2020)

The purpose of SBx7-7 is to establish requirements for the State of California to reduce its statewide urban per capita water use by 20 percent by the year 2020. An interim target is set for 2015, which requires a 10 percent reduction in urban per capita water use. Compliance of the 2015 and 2020 water use targets is a requirement for eligibility for State Water grants and loans.

3.1.2.1 Individual Targets

Under SBx7-7, each individual urban water supplier (i.e., the District) must develop a water use target for the year 2020 using one of four allowable methods. The 2015 interim target is a per capita water use figure which is halfway between the District's base daily per capita water use of 178 gpcd and the 2020 target. There is no penalty for an agency not achieving its 2015 interim target.

There are four methods established by the California Department of Water Resources (DWR) which an urban water supplier may use to develop its 2015 and 2020 water use targets. Three methods are provided in SBx7-7, and the fourth was subsequently established by the DWR. The four methods are generally described below. A more complete description can be found in DWR's *Guidebook to Assist Urban Water Suppliers to Prepare a 2010 Urban Water Management Plan* dated March 2011.

- Method 1: 80 percent of Base Daily Per Capita Use;
- Method 2: Performance standards based on actual water use data for indoor residential water use, landscaped area, and commercial, industrial, and institutional (CII) water use;
- Method 3: 95 percent of the San Francisco Bay hydrologic region; and
- Method 4: Savings by water sector (indoor residential and CII) and landscape and water loss savings.

The District has elected to use Method 1 for the development of its individual water use target. The target under Method 1 is 143 gpcd.

3.1.2.2 Regional Targets

SBx7-7 provides that urban water retail suppliers may plan, comply and report on the 2020 water use target on a regional basis, an individual basis, or both. The District is one of nine Water Contractors that purchases Russian River water supply from the Sonoma County Water Agency (Agency). The Water Contractors are eligible to form a regional alliance, under the provisions of

SBx7-7 because the Water Contractors are recipients of water from a common wholesale water supplier. A water conservation regional alliance among the nine Water Contractors is already in existence and comprises the Sonoma-Marin Saving Water Partnership, thereby effectively combining the regional water conservation efforts with regional alliance for purposes of meeting regional water use targets. The members of the alliance include: Valley of the Moon Water District, City of Sonoma, City of Santa Rosa, Town of Windsor, City of Rohnert Park, City of Cotati, City of Petaluma, Marin Municipal Water District, and North Marin Water District.

The DWR established three options for calculating a regional alliance target. The District, along with the other Water Contractors in the regional alliance, selected Option 1 for establishing the regional alliance target. Option 1 consists of each member of the regional alliance calculating their individual targets and then weighting the individual targets by each member's population. The weighted targets are then averaged to determine the regional alliance target. Detailed calculations under the regional alliance can be found in Appendix B. The regional alliance per capita water use targets in comparison to the projected per capita water use are shown in Table 3-4.

Table 3-4 Regional Water Use Targets

Year	Projected Water Use, AFY	Population	Projected Per Capita Water Use, gpcd	SBx7-7 Water Use Target, gpcd	Meets Target?
2015	95,032	637,687	133	142	Yes
2020	94,602	659,825	128	129	Yes

The District Board approved becoming a member of the regional alliance and using regional targets at its Board meeting of April 19, 2011. A copy of the letter approving the District's membership in the regional alliance is included in Appendix B.

Becoming a member of the regional alliance will help the Water Contractors focus efforts on regional water conservation programs that the District intends to actively engage in through the Sonoma-Marin Saving Water Partnership. This regional effort provides for an "economies of scale" cost benefit for implementing regional programs and also provides for a consistent water conservation message throughout the region.

3.2 Historical and Future Water Use

This section outlines water use in the District by customer type, water sales to other agencies, additional water use, and past and projected water use.

3.2.1. Water Use By Customer Type

Water uses in the District include single-family, apartments, condominiums, commercial, irrigation, government, miscellaneous, pools, and mobile home customers. The historical and projected numbers of connections and deliveries to the District's customers are identified by water use sector in Tables 3-5 through 3-9.

Table 3-5 (DWR Table 3)
Water deliveries — actual, 2005

	2005				
	Metered		Not metered		Total
Water use sectors	# of accounts	Volume	# of accounts	Volume	Volume
Single family	17,785	7,007			7,007
Multi-family	650	724			724
Commercial	1,124	1,189			1,189
Industrial	0	0			0
Institutional/governmental	120	265			265
Landscape (Dedicated Irrigation)	385	1,237			1,237
Agriculture					0
Other					0
Total	20,064	10,422	0	0	10,422

Units (circle one): ***acre-feet per year*** *million gallons per year* *cubic feet per year*

Table 3-6 (DWR Table 4)
Water deliveries — actual, 2010

	2010				
	Metered		Not metered		Total
Water use sectors	# of accounts	Volume	# of accounts	Volume	Volume
Single family	18,031	6,031			6,031
Multi-family	681	695			695
Commercial	1,078	911			911
Industrial	0	0			0
Institutional/governmental	114	251			251
Landscape	427	941			941
Agriculture	1	3			3
Other					0
Total	20,332	8,832	0	0	8,832

Units (circle one): ***acre-feet per year*** *million gallons per year* *cubic feet per year*

Table 3-7 (DWR Table 5)
Water deliveries — projected, 2015

	2015				
	Metered		Not metered		Total
Water use sectors	# of accounts	Volume	# of accounts	Volume	Volume
Single family	19,039	8,108			8,108
Multi-family	739	930			930
Commercial	882	1271			1,271
Industrial	0	0			0
Institutional/governmental	105	312			312
Landscape	408	1183			1,183
Agriculture					0
Other	422	76			76
Total	21,595	11,880	0	0	11,880

Units (circle one): ***acre-feet per year*** *million gallons per year* *cubic feet per year*

Table 3-8 (DWR Table 6)
Water deliveries — projected, 2020

	2020				
	Metered		Not metered		Total
Water use sectors	# of accounts	Volume	# of accounts	Volume	Volume
Single family	19,745	8,300			8,300
Multi-family	765	938			938
Commercial	946	1338			1,338
Industrial	0	0			0
Institutional/governmental	113	334			334
Landscape	437	1268			1,268
Agriculture					0
Other	453	81			81
Total	22,459	12,259	0	0	12,259

Units (circle one): ***acre-feet per year*** *million gallons per year* *cubic feet per year*

Table 3-9 (DWR Table 7)
Water deliveries — projected 2025, 2030, and 2035

	2025		2030		2035 - optional	
	metered		metered		metered	
Water use sectors	# of accounts	Volume	# of accounts	Volume	# of accounts	Volume
Single family	20,215	8,402	20,648	8,509	20,707	8,478
Multi-family	782	938	798	942	800	933
Commercial	1,011	1412	1,036	1433	1,060	1455
Industrial	0	0	0	0	0	0
Institutional/governmental	121	358	124	366	127	375
Landscape	467	1356	479	1388	490	1421
Agriculture						
Other	484	87	496	89	507	91
Total	23,080	12,553	23,581	12,727	23,691	12,753

Units (circle one): ***acre-feet per year*** *million gallons per year* *cubic feet per year*

3.2.2 Water Sales to Other Agencies

The District does not currently sell water to other agencies. The District does convey (wheel) Marin Municipal Water District's Russian River water supply through the North Marin Aqueduct. Marin Municipal pays the District a wheeling charge for the water conveyed which has averaged ~7,830 acre feet per year over the past 10 fiscal years.

Table 3-10 (DWR Table 9)
Sales to other water agencies

Water distributed	2010	2015	2020	2025	2030	2035 - opt
name of agency						
name of agency						
name of agency						
Total	0	0	0	0	0	0

Units (circle one): acre-feet per year million gallons per year cubic feet per year

3.2.3 Additional Water Use and Unaccounted-for Water

The District provides raw (untreated) water directly from Stafford Lake to 2 customers (Indian Valley Golf Course and Stafford Lake Park) for turf irrigation. The raw water is not delivered through the District's distribution system. More information on Recycled Water is found in Section 4-5.

Unaccounted-for water use is unmetered water use, such as that used for fire protection and training, distribution system flushing and construction, sewer cleaning, system leaks, as well as that used by unauthorized connections. Unaccounted-for water use can also result from meter inaccuracies. Table 3-11 provides the estimated quantity of unaccounted-for system water losses. More details on the assumptions made to estimate system losses are presented in the MWM analysis found in Appendix B.

At this time, the District does not use water for groundwater recharge, to prevent salt water intrusion (saline barriers), or for other conjunctive uses.

Table 3-11 (DWR Table 10) Additional water uses and losses							
Water use[1]	2005	2010	2015	2020	2025	2030	2035 - opt
Saline barriers							
Groundwater recharge							
Conjunctive use							
Raw water	204	177	218	218	218	218	218
Recycled water	0	-140	-436	-660	-673	-673	-673
System losses	134	21	895	923	944	959	960
Other (define)							
Total	338	58	677	481	489	504	505

Units (circle one): ***acre-feet per year*** *million gallons per year* *cubic feet per year*

[1] *Any water accounted for in Tables 3 through 7 are not included in this table.*

3.2.4 Summary of Total Water Use

Past, present and future water use for the District system (including system losses) are shown in Table 3-12.

Table 3-12 (DWR Table 11) Total water use							
Water Use	2005	2010	2015	2020	2025	2030	2035 - opt
Total water deliveries (from Tables 3 to 7)	10,422	8,832	11,880	12,259	12,553	12,727	12,753
Less Conservation Savings		-663	-913	-1163	-1413	-1,663	-1,922
Sales to other water agencies (from Table 9)	0	0	0	0	0	0	0
Additional water uses and losses (from Table 10)	338	58	675	481	489	504	505
Total	10,760	8,227	11,642	11,577	11,629	11,568	11,336

Units (circle one): ***acre-feet per year*** *million gallons per year* *cubic feet per year*

3.2.5 Lower Income Water Use Projections

SBx7-7 includes a new requirement for identifying water use for lower income households. Under the statute, a lower income household as defined under the California Health and Safety Code and is established to be 80 percent of median income, adjusted for family size. Based on Census data for the Novato service area, the 80 percent median income figure is approximately $64,738 and the lower income households are estimated to comprise approximately 40.2 percent of the total households. Table 3-13 (DWR Table 8) shows the projected water demands for lower income households, and is based on 40.2 percent of the total single-family and multi-family residential projected water use.

Table 3-13 (DWR Table 8)
Low-income projected water demands

Low Income Water Demands[1]	2015	2020	2025	2030	2035 - opt
Single-family residential	3,259	3,337	3,378	3,421	3,408
Multi-family residential	374	377	377	379	375
Total	3,633	3,714	3,755	3,799	3,783

Units (circle one): ***acre-feet per year*** *million gallons per year cubic feet per year*
[1]Provide demands either as directly estimated values or as a percent of demand. In Novato Lower Income Households comprise approximately 40.2% of total households.

3.3 Demand on Wholesale Supply

The Agency provides approximately 80 percent of the water distributed by the District. Table 3-14 provides the projected amount of water that the District expects to purchase from the Agency to meet water demands in the future.

Table 3-14 (DWR Table 12)
Retail agency demand projections provided to wholesale suppliers

Wholesaler	Contracted Volume[1]	2015	2020	2025	2030	2035 -opt
Sonoma County Water Agency	14100	9182	9291	9831	10372	10912

[1] Entitlement Limit pursuant to the Restructured Agreement for Water Supply. See Section 4.1.3 for further discussion.

The District has provided the demand projections to the Agency. However, the projected 2015 and subsequent years' water demands are based on a 2010 planning estimate. 2010 water use is not representative of normal water use characteristics for the Agency and its customers (Water Contractors). From 2007-2010, the Agency and the Water Contractors' water use was significantly affected by a number of factors including drought conditions, implementation of water shortage response plans, economic recession, and increases in residential and commercial vacancy. Lasting effects of the drought, water shortage, and economic recession, as well as a cool summer, significantly affected the Agency and Water Contractors' 2010 water use and is not representative of normal water use characteristics.

It is not known whether or how much of this projected amount will actually occur and the District will be coordinating and working closely with the Agency to determine the timing of capital improvement projects that may need to come online in order to meet the District's water demands.

The remaining water demand not met with Agency supply will be met with a combination of the District's own surface water supply, water conservation implementation, and recycled water implementation.

3.4 Water Use Reduction Plan

The phrases Best Management Practices (BMPs) and Demand Management Measures (DMMs) are used interchangeable throughout the Maddaus Water Management (MWM) Report included in Appendix B and also referred to in this UWMP as "conservation measures." The District's water use reduction plan is detailed in the MWM analysis. The MWM analysis identifies current and projected savings from the District's conservation programs. The programs include the following conservation program categories:

- Tier 1. Tier 1 consists of BMPs that were originally identified and established by the California Urban Water Conservation Council (CUWCC). A Memorandum of Understanding (MOU) was voluntarily signed by many urban water agencies and environmental groups who pledged to develop and implement 14 conservation BMPs. The District became a signatory to the MOU in October 2001.

- Tier 2. Tier 2 consists of conservation measures beyond Tier 1. District staff conducted a review and screening of various conservation measures that included a water savings

device or program that would result in a reduction in water uses. Tier 2 measures that were selected by the District for implementation included rain sensor retrofits, smart irrigation controllers, and landscape and irrigation requirements.

- New Development Standards (ND). These are a subset of Tier 2 measures which apply to new development. Conservation savings resulting from Cal Green building codes have been included as this affects all new development in California after January 1, 2011. The District does not have land use approval authority, but relies on the implementing ordinances of the County of Sonoma. The County ordinance for Cal Green was adopted and became effective on January 1, 2011.

3.4.1 Water Demand Reduction Goals and Programs

Based on the programs identified in the section above, the MWM analysis identified a conservation savings of 1,922 AFY by 2035. This amount of conservation savings is a result of Tier 1, Tier 2, and ND. Also included in the conservation savings of 1,922 AFY, are savings resulting from State-mandated plumbing code changes in the Building Code.

3.5 Implementation Plan for GPCD Reduction

The implementation plan is discussed in detail in the MWM analysis included in Appendix B. The plan is summarized below and includes the following conservation measures:

- CUWCC #1 – Residential Water Surveys, Interior
- CUWCC #2 – Residential Water Surveys, Outdoor
- CUWCC #3 – System Water Loss Reduction
- CUWCC #5a – Large Landscape Water Budgets
- CUWCC #5b – Large Landscape Audits
- CUWCC #6 – Washer Rebates
- CUWCC #7 – Residential Public Education
- CUWCC #9 – Commercial Water Audits
- CUWCC #14 – Residential Single Family Toilet Replacement

- Tier 2 – ND1, Rain Sensor Retrofit
- Tier 2 – ND2, Smart Irrigation Controller
- Tier 2 – ND8, Landscape and Irrigation Requirements

The District's service area has a high proportion of residential water use and a significant amount of outdoor water use. Consequently, residential conservation programs produce the most savings. The District's service area does not have a heavy manufacturing sector, so the conservation potential in the commercial sector is relatively low. The District's implementation plan includes a projected water conservation savings from the measures listed above.

3.5.1 Current Plan and Economic Impacts

The economic evaluation is shown in Table 18 of the MWM analysis for Tier 1, Tier 2, and ND programs. The water utility benefit-cost ratio for the District's program is 3.48, community benefit-cost ratio is 1.45, and the utility cost of water saved is $249 per acre-feet. Based on the analysis provided in the MWM analysis and the assumed avoided cost of new water, water conservation programs are cost-effective for the District.

3.5.2 Additional Measures for Future Reduction

The District's implementation plan described above will provide for meeting its individual water use target in 2020; therefore, no additional measures are being investigated at this time.

SECTION 4
SYSTEM SUPPLIES

The District uses both imported water from the Russian River and local Stafford Lake surface water as its supply sources for the Novato Water System. Recycled water as an additional source of supply began in 2007. The Russian River water supplied by the Agency is supplemented by three Agency owned groundwater wells. This section describes the surface water and groundwater sources, quantities, supply constraints, and the reliability of the water supply sources.

4.1 Surface Water

This section describes the District's surface water supply and that which is purchased from the Agency, as well as the physical and legal constraints to this supply. The surface water supply facilities are described in Section 2.

4.1.1 Description

The District receives its primary water supply from the Agency's transmission system. The Agency is supplied by the federal Russian River Project, which it operates along with the Agency's appurtenant water transmission system. The Coyote Valley Dam, which creates Lake Mendocino on the East Fork Russian River, and Warm Springs Dam, which creates Lake Sonoma on Dry Creek (a tributary to the Russian River), are the key elements of the Russian River Project. The Agency manages releases at both reservoirs for water supply and to maintain required minimum flows in the Russian River and Dry Creek principally for fishery protection, recreation and to satisfy direct diversions by other Russian River users. Flood control releases from each of the reservoirs are controlled by the United States Army Corps of Engineers (USACE). Flows in the Russian River are augmented by Pacific Gas & Electric Company's (PG&E) Potter Valley Project, which diverts a portion of the Eel River flows to the East Fork of the Russian River.

Water from the Russian River is diverted by the Agency near Forestville and conveyed via its transmission system (including diversion facilities, treatment facilities, pipelines, water storage tanks, booster pump stations, and groundwater wells) to its wholesale customers, including the District. Releases from storage for rediversion by the Agency's water transmission system are generally made from Lake Sonoma. Hydrologic and hydraulic modeling studies prepared by the Agency and reported in the Agency's 2010 UWMP indicate that adequate water supplies are

available in Lakes Mendocino and Sonoma to meet in-stream flows, system losses and demands for average and multiply dry year scenarios through 2035. The Agency model results also show that demand curtailments will be triggered during portions of the year in a single dry year scenario.

The District supplements the water supply received from the Agency with a local surface water supply from Stafford Lake. Stafford Lake, which captures runoff from an area of 8.3 square miles, is located four miles west of downtown Novato. Runoff contributing flow to the lake is provided from land near the upper reaches of Novato Creek. The capacity of Lake Stafford is 4,450 ac-ft at a water surface elevation of 196 feet MSL. Further detail on the District's water supply facilities and distribution system is included in Section 2.

4.1.2 Physical Constraints

The capacity of the Agency's transmission system is a physical constraint that currently limits the District's water supply from the Agency. The District receives water through the 7.6 mile long North Marin Aqueduct, which is a 30-inch diameter cement-lined and coal tar-coated steel transmission main that runs from the Agency's Petaluma Aqueduct near Kastania Tank and Pump Station in south Petaluma to the connection to the District's transmission/distribution system north of San Marin Drive.

4.1.3 Legal Constraints

This section of the plan describes the water rights held by the Agency and the various agreements and issues that influence the available water supply. The District's share of the Agency's water supply, and the District's separate water rights, are also described.

Agency Water Rights. Four State Water Resources Control Board (SWRCB) permits[1] currently authorize the Agency to store water in Lake Mendocino (122,500 ac-ft/yr) and Lake Sonoma (245,000 ac-ft/yr) and to divert and redivert 180 cubic feet per second (cfs) of water from the Russian River, up to 75,000 ac-ft/yr. The Agency has applied to the SWRCB to increase the Agency's Russian River rediversion right above 75,000.

[1]SWRCB Permits Numbers 12947A, 12949, 12950, and 16596.

The permits also establish minimum instream flow requirements for fish and wildlife protection and Russian River recreational considerations. These minimum instream flow requirements vary according to the hydrologic cycle (i.e., dry water years versus normal water years) defined by the SWRCB's Decision 1610. The Agency meets the various instream Decision 1610 flow requirements by making releases from Coyote Valley Dam and Warm Springs Dam.

Restructured Agreement. The Restructured Agreement for Water Supply (Restructured Agreement), executed in 2006 between the Agency and eight signatory Water Contractors including the District, provides for the finance, construction, and operation of existing and new Russian River diversion facilities, transmission lines, storage tanks, booster pumps, conventional wells and appurtenant facilities. The Restructured Agreement includes specific Entitlement Limits, or maximum amounts of water, that the Agency is obligated to supply to its Water Contractors including the District. Additionally, the Restructured Agreement provides for development of (1) additional alternative water supply investments (conservation, local supply and water recycling), and (2) Russian River watershed ecosystem restoration activities.

Delivery entitlements established in the Restructured Agreement and allocated to the District are 19.9 mgd during the average day of the peak month and 14,100 acre feet per year. The Agency's delivery obligations under the Restructured Agreement are subject to numerous conditions, many of which currently impact the Agency's ability to deliver water. Provisions for apportionment of water during periods of shortage are stipulated in the Restructured Agreement.

Russian River Biological Opinion. In September 2008, a final Biological Opinion (BO) was released by the National Marine Fisheries Service (NMFS) and issued to the Agency, the U.S. Army Corps of Engineers, the California Department of Fish and Game, and the Mendocino County Russian River Flood Control and Water Conservation Improvement District. The BO is a federal mandate on Russian River operations of the receiving agencies listed above that affect salmonids on state and federal endangered species lists (steelhead, coho and Chinook) which affects the Agency's water supply operations and subsequent delivery to its water contractors, including the District.

The BO calls for the elimination or reduction of impacts to salmonids due to water supply and flood control activities in the Russian River watershed through measures deemed "reasonable and prudent alternatives," including:

- Extensive monitoring of both habitat and fish in Dry Creek, the estuary and the Russian River;
- Eliminating impediments to fish migration and improving habitat on several streams;
- Restoring up to six miles of habitat in Dry Creek and studying a bypass project;
- Requesting the State Water Resources Control Board to reduce summertime flows in the Russian River;
- Creating a freshwater lagoon in the estuary at the mouth of the Russian River during the summer months.

NMFS concluded that lower flows in Dry Creek and Russian River create a better environment for juvenile salmon and steelhead and the BO identified habitat restoration projects in Dry Creek to reduce water velocities in the stream. Current minimum summer flows are based on weather conditions, and range from 125 cfs (during a normal year, as measured at Hacienda Bridge in Guerneville) to 85 cfs (as measured during a dry year). Under the terms of the BO, minimum flows would be dropped to 70 cfs with an additional 15 cfs to maintain system flexibility for a total flow of 85 cfs. For a more complete and comprehensive discussion of minimum flow requirements, refer to the Agency's 2010 UWMP. The BO acknowledged a need for balance and flexibility and noted that the Agency may find alternative minimum flow requirements that meet the goals of restoring functional salmonid-rearing habitat while promoting water conservation and limited adverse effects on other in-stream resources.

District Water Rights. The District holds two water rights on Novato Creek with the SWRCB: (1) License 9831 issued in 1970, and (2) Water Right Permit 18800 issued in 1983. License 9831 allows the District to directly divert up to 2.9 cubic feet per second (cfs) and to divert 4,000 ac-ft to storage in Stafford Lake between October 1 and April 30. The total amount of direct diversion and diversion to storage authorized during a water year (between October 1 and September 30 of the subsequent year) under License 9831 is 4,490 ac-ft.

Water Right Permit 18800 allows the District to directly divert up to 9.75 cfs from Novato Creek between October 1 and April 30 and to divert up to 4,400 ac-ft to storage between November 1 and April 1. Although Water Right Permit 18800 limits the total storage between both Water Right

Permit 18800 and License 9831 to 4,400 ac-ft, it allows for a maximum of 8,454 ac-ft to be diverted from the Novato Creek during any water year.

4.2 Groundwater

The District does not currently own or operate any groundwater wells, although private wells exist within the District's service area. The District does not pump groundwater, as the potential for salt water intrusion restricts the feasibility of utilizing groundwater. The groundwater basin that supplements the Agency's supply is described in the Agency's 2010 UWMP.

4.2.1 Description

The groundwater basin underlying the District is located in the Novato Valley Basin in the San Francisco Bay Hydrologic Region (Figure 4-1). According to California's Groundwater Resources Bulletin 118-Update 2003, the Novato Valley Basin Number is 2-30. The basin occupies a structural depression in the eastern Coast Range west of San Pablo Bay. The basin drains to San Pablo Bay and the areas close to the bay are tidally influenced.

The water-bearing deposits underlying the District are primarily the alluvial deposits of Pleistocene and Holocene age. These alluvium deposits overlie the non-water-bearing Franciscan Formation (California Department of Water Resources, 2004). The alluvium is composed of silt, clay, and sand with some lenses of gravel. Groundwater wells screened in sand and gravels yield approximately 50 gpm.

Most of the natural recharge occurs along stream beds and on the basin floor from direct percolation. Soils beneath the District are predominantly Reyes silty clays with low permeability.

The District historically has pumped no groundwater (Table 4-1).

Table 4-1 (DWR Table 18)
Groundwater — volume pumped

Basin name(s)	Metered or Unmetered[1]	2006	2007	2008	2009	2010
Total groundwater pumped		0	0	0	0	0
Groundwater as a percent of total water supply		0.00%	0.00%	0.00%	0.00%	0.00%

Units (circle one): acre-feet per year million gallons per year cubic feet per year

[1] *Indicate whether volume is based on volumetric meter data or another method*

The District does not anticipate pumping groundwater in the future (Table 4-2).

Table 4-2 (DWR Table 19)
Groundwater — volume projected to be pumped

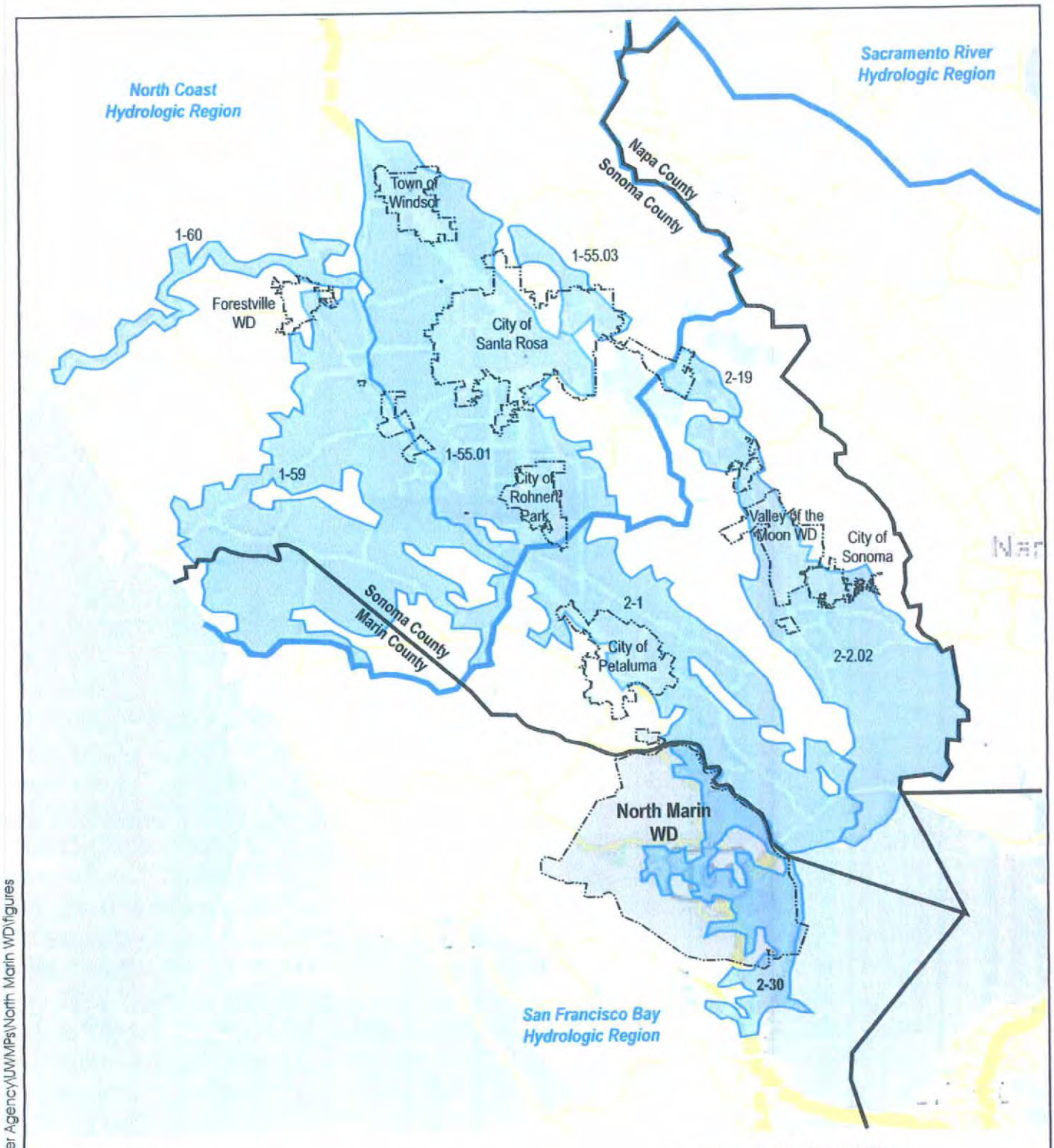
Basin name(s)	2015	2020	2025	2030	2035 - opt
Total groundwater pumped	0	0	0	0	0
Percent of total water supply	0.00%	0.00%	0.00%	0.00%	0.00%

Units (circle one): acre-feet per year million gallons per year cubic feet per year

Include future planned expansion

4.2.2 Physical Constraints

The groundwater quality is considered poor due to high salinity, and well yields are too low for municipal supply. Water quality is discussed further in Section 4-6.



Source: Google Map data 2005 NAVTEC™
DWR Bulletin 118, 2003 Update

	PROJECT	SITE	Figure
		UWMP 2010, North Marin Water District	4-1
	DATE 3/6/06	TITLE Groundwater Basins	

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4.2.3 Legal Constraints

There are no legal constraints on the District's use of its groundwater supply; however, the District has no groundwater wells.

4.3 Desalination

Although the District has not investigated the feasibility of constructing a desalination plant, the neighboring Marin Municipal Water District (MMWD) has constructed a pilot-scale desalination plant (the MMWD Seawater Desalination Pilot Plant). If a full-scale desalination plant were constructed, it is possible that the District could supplement its water supply with desalinated water under a future agreement with MMWD. However, because the determination of potential full-scale MMWD desalination plant is yet uncertain, it is not included in this Plan as a future water supply source.

4.4 Transfer and Exchange Opportunities

Currently, when surplus transmission system capacity is available, MMWD receives Russian River water from the Agency through the District's North Marin Aqueduct under the MMWD Supplemental Water Supply Agreement with the Agency. A provision of the Intertie Agreement between the District and MMWD allows for delivery ("wheeling") of MMWD's Russian River water through the District's aqueduct. Because MMWD has a direct agreement with the Agency, Russian River water delivered to MMWD does not affect the District's allocation. Over the past 10 years, deliveries of Russian River water wheeled to MMWD have averaged 7,830 acre feet.

Table 4-3 (DWR Table 20)
Transfer and exchange opportunities

Transfer agency	Transfer or exchange	Short term or long term	Proposed Volume
Total	0	0	0

Units (circle one): acre-feet per year million gallons per year cubic feet per year

Although the District does not currently transfer or exchange water with other entities, water transfers between the Agency's water contractors are authorized under the Restructured Agreement. Such transfers and exchanges between Agency water contractors have been necessary in the past and may be necessary in the future to improve water supply reliability.

4.5 Recycled Water Opportunities

Water recycling is the treatment and management of municipal, industrial, or agricultural wastewater to produce water that can be reused for beneficial uses, and offset demands for potable water supplies. Water recycling provides an additional source of water that can be used for purposes such as irrigation, groundwater recharge, industrial uses, and environmental restoration. "Recycled water" is defined in the California Water Code as "water which, as a result of treatment of waste, is suitable for a direct beneficial use or a controlled use that would not otherwise occur." The California Department of Public Health (DPH) sets the water quality criteria for specific uses of recycled water in Title 22 of the California Code of Regulations.

This section provides information on the amount of generated wastewater and existing disposal of wastewater to look at the potential for recycled water use by the District. The amount of recycled water currently used, potentially available, and future potential uses for recycled water for the District are also described.

4.5.1 Coordination

The District worked in coordination with the Novato Sanitary District (NSD) to update the Recycled Water Master Plan and evaluate the economic feasibility of implementing a recycled water system to serve landscape irrigation users in the Novato area. The Deer Island Recycled Water Facility (RWF) was completed in 2007 and delivery of recycled water to StoneTree Golf Course began. In 2009, recycled water was extended to Novato Fire Protection District Station 62.

Since 2005, the District has been working with the North Bay Water Reuse Authority (NBWRA) to expand use of recycled water on a regional basis in the North San Pablo Bay region. As a result, the District now has an agreement with NSD to expand the treatment and delivery of recycled water in the North and Central area of Novato and has an agreement with Las Gallinas Valley Sanitary District (LGVSD) to expand the treatment and delivery of recycled water in the South area of Novato, principally the Hamilton Field area. NBWRA has been authorized to receive a

25% federal grant from the US Bureau of Reclamation, up to $25M toward expansion of recycled water. $8.6M has been appropriated to date and District recycled water expansion projects are underway.

4.5.2 Wastewater Collection and Treatment

NSD operates the Novato Treatment Plant which serves all Novato and treats wastewater to a secondary treatment standard with the additional treatment processes of ammonia removal and filtration. During the winter months the treated water flows to San Pablo Bay via an outfall pipe. During the summer months the treated water is recycled and used to irrigate pastures and operate the Deer Island wildlife pond adjacent to Highway 37. The Deer Island RWF provides recycled water standards to meet Title 22 requirements for unrestricted bodily contact. The current and projected volume of collected wastewater and the amount that meets recycled water standards is shown in Table 4-4.

Table 4-4 (DWR Table 21)
Recycled water — wastewater collection and treatment

Type of Wastewater	2005	2010	2015	2020	2025	2030	2035 - opt
Wastewater collected & treated in service area	7,570	7,860	8,150	8,440	8,730	8,730	8,730
Volume that meets recycled water standard	2,400	2,710	3,080	3,450	3,850	4,170	4,170

Units (circle one): ***acre-feet per year*** *million gallons per year* *cubic feet per year*

4.5.3 Wastewater Disposal

The San Francisco Bay Regional Water Quality Control Board (SFBRWQCB) regulates discharges to the San Pablo Bay by the Novato wastewater treatment plants. The current and projected annual volume of disposed wastewater is shown in Table 4-5.

Table 4-5 (DWR Table 22) Recycled water — non-recycled wastewater disposal							
Method of disposal	**Treatment Level**	**2010**	**2015**	**2020**	**2025**	**2030**	**2035 - opt**
San Pablo Bay Discharge	Secondary	5,150	5,340	5,530	5,720	5,720	5,720
Name of method							
Name of method							
Name of method							
	Total	5,150	5,340	5,530	5,720	5,720	5,720
Units (circle one): ***acre-feet per year*** *million gallons per year* *cubic feet per year*							

Figure 4-2 depicts the location of the wastewater treatment facility and reclamation facilities for the District's service area.

4.5.4 Existing Recycled Water Use

Projections for recycled water use for 2010 made in the 2005 Urban Water Management Plan are included in Table 4-6.

Table 4-6 (DWR Table 24)
Recycled water — 2005 UWMP use projection compared to 2010 actual

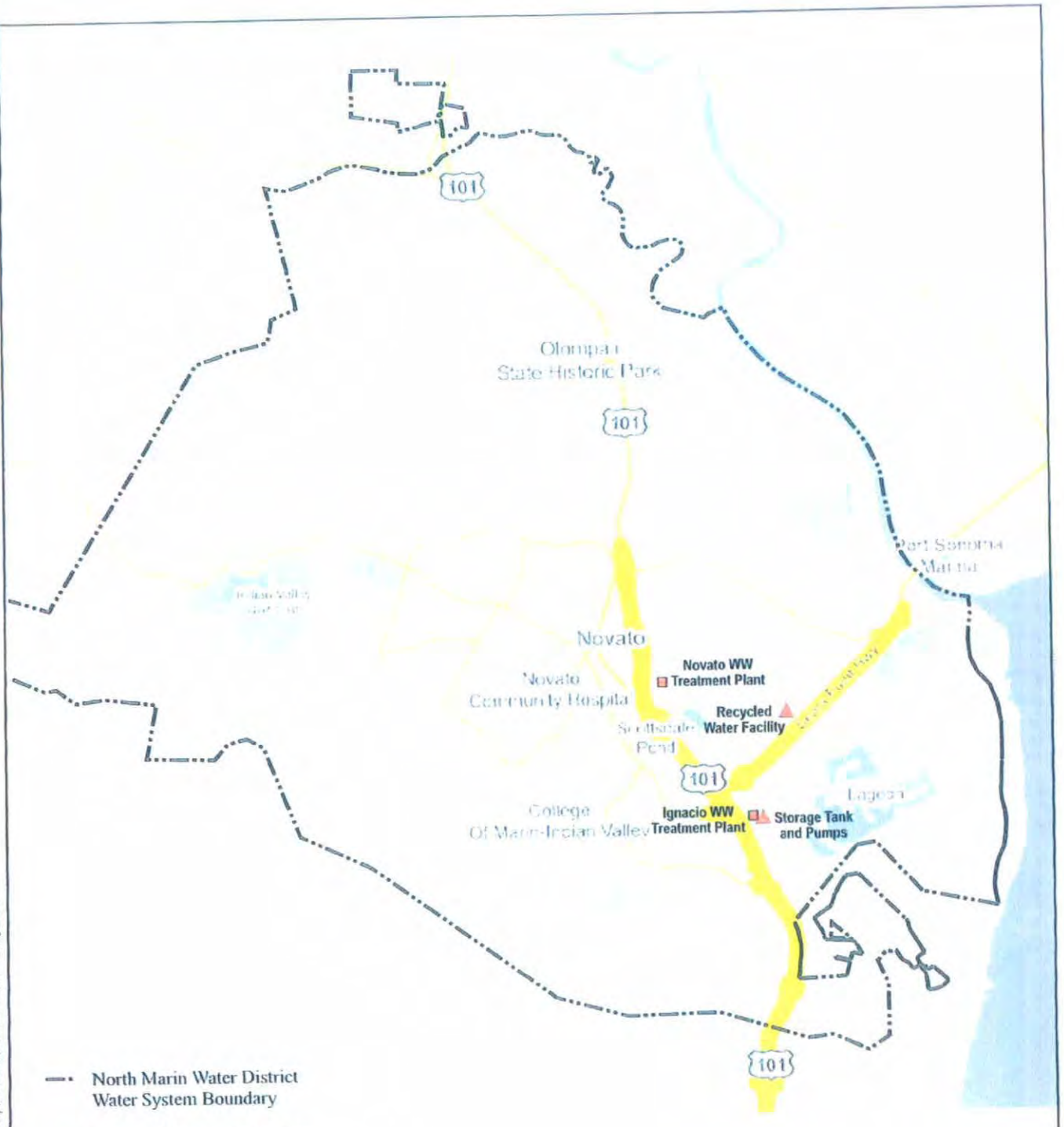
Use type	2010 actual use	2005 Projection for 2010[1]
Agricultural irrigation	2,450	2,450
Landscape irrigation[2]	140	430
Commercial irrigation[3]		
Golf course irrigation		
Wildlife habitat		
Wetlands		
Industrial reuse		
Groundwater recharge		
Seawater barrier		
Geothermal/Energy		
Indirect potable reuse		
Other (user type)		
Other (user type)		
Total	2,590	2,880

Units (circle one): ***acre-feet per year*** *million gallons per year* *cubic feet per year*

1 From the 2005 UWMP. There has been some modification of use types. Data from the 2005 UWMP can be left in the existing categories or modified to the new categories, at the discretion of the water supplier.

2 Includes parks, schools, cemeteries, churches, residential, or other public facilities)

3 Includes commercial building use such as landscaping, toilets, HVAC, etc.) and commercial uses (car washes, laundries, nurseries, etc.)



Source: Google Map data 2005 NAVTEC™
Nute Engineering, Novato Sanitary District,
Recycled Water Master Plan, 2004

		SITE: UWMP 2010, North Marin Water District	Figure 4-2
	DATE: 3-6-06	TITLE: Location of Existing and Potential Wastewater and Recycled Water Facilities	

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4.5.5 Potential and Projected Recycled Water Use Plan

The "Recycled Water Master Plan" completed in February 2004 by Nute Engineering produced a focused study of potential recycled water uses and estimated the cost to build a recycled water system. The StoneTree Golf Course at Black Point was identified as an ideal customer and recycled water use began in 2007.

The volume of potential recycled water use, based on the amount potentially available, is shown in Table 4-7. However, a major factor that determines the use of recycled water and implementation of recycled water projects is the financial feasibility of connecting users to the system. Recycled water distribution systems require additional pipelines, storage tanks, and pumps. Proximity to the production of the recycled water and the distribution system is a major factor in considering use of recycled water. The District is planning to convert some decommissioned hilltop potable water tanks to store recycled water. In addition, the recycled water users must make their own investment in constructing and operating the on-site irrigation pipelines and sprinkler systems with the necessary warning signs, backflow prevention, and associated health and safety requirements. The projected future use of recycled water use within the District for the next 25 years is shown in Table 4-7.

Table 4-7 (DWR Table 23) Recycled water — potential future use							
User type	**Description**	**Feasibility[1]**	**2015**	**2020**	**2025**	**2030**	**2035 - opt**
Agricultural irrigation	Secondary		2,500	2,550	2,600	2,600	2,600
Landscape irrigation[2]	Tertiary		580	900	1,250	1,570	1,570
Commercial irrigation[3]							
Golf course irrigation							
Wildlife habitat							
Wetlands							
Industrial reuse							
Groundwater recharge							
Seawater barrier							
Geothermal/Energy							
Indirect potable reuse							
Other (user type)							
Other (user type)							
	Total	0	3,080	3,450	3,850	4,170	4,170

Units (circle one): ***acre-feet per year*** *million gallons per year* *cubic feet per year*

[1] *Technical and economic feasibility.*

[2] *Includes parks, schools, cemeteries, churches, residential, or other public facilities)*

[3] *Includes commercial building use such as landscaping, toilets, HVAC, etc.) and commercial uses (car washes, laundries, nurseries, etc)*

4.5.6 Promotion of Recycled Water Use

Methods to encourage recycled water use and the projected amount of recycled water uses are listed in Table 4-8.

Table 4-8 (DWR Table 25)
Methods to encourage recycled water use

	Projected Results					
Actions	**2010**	**2015**	**2020**	**2025**	**2030**	**2035 - opt**
Financial incentives						
Programmatic Implementation	140	436	660	673	673	673
name of action						
Total	140	436	660	673	673	673

Units (circle one): ***acre-feet per year*** *million gallons per year* *cubic feet per year*

The Agency encourages recycled water use by collecting, as part of its water rates, funds to be held in a special reserve for projects carried out by its prime water customers.

4.6 Current and Projected Water Supplies

This section provides projections of the future water supply quantities available to the District. Future water supplies from the Agency are dependent upon planned infrastructure improvements being approved and constructed. Future projects that may contribute to the District's water supply from the Agency and the quantity are summarized in Table 4-9.

Table 4-9 (DWR Table 26)
Future water supply projects

Project name[1]	Projected start date	Projected completion date	Potential project constraints[2]	Normal-year supply[3]	Single-dry year supply[3]	Multiple-dry year first year supply[3]	Multiple-dry year second year supply[3]	Multiple-dry year third year supply[3]
Recycled Water Expansion North & South	2011	2015	Financing	436	436	436	436	436
Recycled Water Expansion Central	2015	2025	Financing	673	673	673	673	673
Agency South Transmission System Project	2020	2022	CEQA, Financing	NA	NA	NA	NA	NA
Agency Modify/Acquire Additional Water Rights	2020	2027	CEQA	TBD	TBD	TBD	TBD	TBD
		Total	0	1,109	1,109	1,109	1,109	1,109

Units (circle one): ***acre-feet per year*** *million gallons per year* *cubic feet per year*

[1] *Water volumes presented here should be accounted for in Table 16.*

[2] *Indicate whether project is likely to happen and what constraints, if any, exist for project implementation.*

[3] *Provide estimated supply benefits, if available.*

The Recycled Water Projects shown are currently underway or planned by the District.

The Agency reports uncertainty regarding the rate that water demands will increase, especially in the near-term, given the existing economic conditions and recent drought events. The Agency project schedule described in Table 4-9 is based on the demand projects provided by the water contractors; and the Agency believes the near-term projections (through 2020) are worst-case scenarios, and the growth rate of water demand may be lower, thus extending the dates that the transmission system projects (including the South Transmission System Project) will be needed. The Agency intends to continue to work with its Water Contractors and other customers to monitor actual water demands relative to their demand projections. Also, the Agency will assist the Water Contractors' evaluation of local projects (e.g., new storage, additional conservation, or recycled water projects) to help mitigate the necessity, or delay the need for the Agency projects identified in Table 4-9.

4.7 Water Supply Strategies

The Agency's commitment to providing a reliable water supply to its customers in future years has prompted development of new water supply strategies.

The Agency staff initially developed 12 strategies that the Water Agency's Board of Directors reviewed and generally approved in April 2009. The strategies were revised and a draft Water Supply Strategies Action Plan was developed with input from the water contractors and the community following a 17-month outreach program. In September 2010, the Agency's Board of Directors approved the Water Supply Strategies Action. The Action Plan included a revised set of nine strategies, as presented in Table 4-10.

The strategies and Action Plan are based on the following considerations:

- No entity can do it alone: Coordination and partnerships are essential to achieving reliable, efficient, and sustainable water resource management.
- None of the strategies stand alone: The strategies are interconnected.
- The Action Plan is a living document: The plan is a snapshot and should be modified as progress is made and conditions change.
- Public education and input: Transparency is critical to success.

For each of the nine strategies, the Action Plan defines specific activities and projects, involved parties, activity/project status, budget, and timing. The timing of each activity is categorized as either immediate, near term, or long term. The Action Plan is available on the Agency's website (http://www.scwa.ca.gov/water-supply-strategy/).

Table 4-10 Water Supply Strategies

Strategy 1	Address Dry Creek Summer Flows
Strategy 2	Modify Operation of Russian River System
Strategy 3	Evaluate Potential Climate Change Impacts on Water Supply & Flood Protection
Strategy 4	Pursue Combined Water Supply & Flood Control Projects
Strategy 5	Work With Stakeholders To Promote Sound, Information-Based Water Supply Planning Programs
Strategy 6	Improve Transmission System Reliability
Strategy 7	Take Advantage Of Energy And Water Synergies
Strategy 8	Implement Integrated Water Management
Strategy 9	Overcome Organizational Fragmentation To Promote Efficiency Of Water System Operations & Planning

Table 4-11 summarizes the current and projected water supplies available to the District. Recycled water use is described in further detail in Section 5. The amount of raw water utilized for irrigation through 2030 is expected to remain constant (Sonoma County Water Agency, 2000).

Table 4-11 (DWR Table 16)
Water supplies — current and projected

Water Supply Sources		2010	2015	2020	2025	2030	2035 - opt
Water purchased from[1]:	Wholesaler supplied volume (yes/no)						
Wholesaler 1 (Sonoma County Water Agency)	(yes)	6,198	9,182	9,291	9,831	10,372	10,912
Wholesaler 2 (enter agency name)							
Wholesaler 3 (enter agency name)							
Supplier-produced groundwater[2]							
Supplier-produced surface water		2,456	2,500	2,500	2,167	1,684	1,000
Transfers in							
Exchanges In							
Recycled Water		140	436	660	673	673	673
Desalinated Water							
Other - Local Supplier Produced Raw Water		177	218	218	218	218	218
Other							
Total		8,971	12,336	12,669	12,889	12,947	12,803

Units (circle one): ***acre-feet per year*** *million gallons per year* *cubic feet per year*

[1] Volumes shown here should be what was purchased in 2010 and what is anticipated to be purchased in the future. If these numbers differ from what is contracted, show the contracted quantities in Table 17.

[2] Volumes shown here should be consistent with Tables 17 and 18.

SECTION 5

WATER SUPPLY RELIABILITY AND WATER SHORTAGE CONTINGENCY PLANNING

This section presents the projected supplies available during single-and multiple-dry water years. Actions that would be undertaken during a short term water supply curtailment are addressed in the Water Shortage Contingency Plan, which is presented in Appendix C.

5.1 Reliability Comparison

The reliability of the District's water sources is summarized in Table 5-1. The District's surface water supply from the Agency is subject to curtailment during dry years (seasonal and climatic shortages). When Lake Sonoma water volume is less than 100,000 ac-ft, a 30 percent reduction in diversions is required by the SWRCB water-rights Decision 1610[2]. The reliability of recycled water is not anticipated to be affected by single- or multiple-dry water years.

Table 5-1 (DWR Table 31)
Supply reliability — current water sources

Water supply sources[1]	Average / Normal Water Year Supply[2]	Multiple Dry Water Year Supply[2]		
		Year 2011	Year 2012	Year 2013
Sonoma County Water Agency	9,182	9,182	9,182	9,182
Local Surface Water	2,500	2,500	2,500	2,500
Recycled Water	140	140	140	140
Total Supply	11,822	11,822	11,822	11,822
Percent of normal year:		100%	100%	100%

Units (circle one): ***acre-feet per year*** *million gallons per year* *cubic feet per year*

[1] *From Table 16.*

[2] *See Table 27 for basis of water type years.*

Table 5-2 lists the years upon which the data in Table 5-1 are based.

Table 5-2 (DWR Table 27)
Basis of water year data

Water Year Type	Base Year(s)
Average Water Year	1962
Single-Dry Water Year	1977
Multiple-Dry Water Years	1988-1991

Factors resulting in inconsistency of supply are summarized in Table 5-3. Alternatives to replace inconsistent sources may potentially include the development of groundwater wells, aquifer storage and recovery, use of recycled water, use of desalinated water from MMWD, and increased conservation. Water quality issues are not anticipated to have a significant impact on water supply reliability. If applicable in the future, chemical contamination and the lowering of maximum contaminant levels (MCLs) for naturally occurring constituents can be mitigated by constructing new treatment facilities. These treatment facilities would have a significant cost.

Table 5-3 (DWR Table 29)
Factors Resulting in Inconsistency of Supply

Water supply sources[1]	Sonoma County Water Agency	Local Surface Water	Recycled Water	
Specific Sources Name (if any)	Russian River surface water	Stafford Lake	Novato Sanitary District	Las Gallinas Valley Sanitary District
Limitation Quantification	14,100 acre-feet per year[2] 19.9 million gallons per day	8454 acre-feet per year	356 acre feet/year	220 acre feet/year
Legal	Controlled by 4 SWRCB permits and subject to permit constraints including reductions in water supply during water shortage years; District will need to increase entitlement limit by 2035 to meet demands.	6 mgd Controlled by 1 SWRCB license and 1 SWRCB permit	Inter Agency Agreement between NMWD as NSD	Inter Agency Agreement between NMWD and LGVSD
Environmental	Biological Opinion calls for reduction of impacts to salmonids and results in minimum flow requirements during normal and dry years	None	None	None
Water Quality	None	None	None	None
Climatic	Water supply curtailments during drought conditions	None	None	None
Additional Information				

Units (circle one): ***acre-feet per year*** *million gallons per year* *cubic feet per year*

[1] *From Table 16.*

[2] *Entitlement Limit pursuant to the Restructured Agreement for Water Supply. See Section 4.1.3 for further discussion.*

Agency projections that quantify water availability to the District through 2035 are presented in Table 5-4.

Table 5-4 (DWR Table 17)
Wholesale supplies — existing and planned sources of water

Wholesale sources[1,2]	Contracted Volume[3]	2015	2020	2025	2030	2035 - opt
Sonoma County Water Agency	14,100	9,182	9,291	9,831	10,372	10,912
(source 2)						
(source 3)						

Units (circle one): ***acre-feet per year*** *million gallons per year* *cubic feet per year*

[1] *Water volumes presented here should be accounted for in Table 16.*
[2] *If the water supplier is a wholesaler, indicate all customers (excluding individual retail customers) to which water is sold. If the water supplier is a retailer, indicate each wholesale supplier, if more than one.*
[3] *Indicate the full amount of water. Entitlement Limit pursuant to the Restructured Agreement for Water Supply. See Section 4.1.3 for further discussion.*

A water supply reliability comparison for the Agency supply is made in Table 5-5, considering three water supply scenarios: normal water year, single-dry water year, and multiple-dry water years.

Table 5-5 (DWR Table 28)
2035 Supply Reliability — Historic Conditions (AFY)

Water Supply Sources	Avg/Normal Water Year	Single Dry Water Year	Multiple Dry Water Years			
			Year 1	Year 2	Year 3	Year 4
Sonoma County Water Agency Local Surface Water Recycled Water	10912 1000 673	7991 2500 673	10912 1000 673	10912 1000 673	10912 1000 673	10912 1000 673
Total	12985	11164	12585	12585	12585	12585
Percent of Average/Normal Year:	100.0%	89.0%	100.0%	100.0%	100.0%	100.0%

Factors resulting in inconsistency of the Agency's supply are included in Table 4-13.

5.2 Water Quality Impacts on Future Water Supply

The quality of the District's water deliveries is regulated by the California Department of Public Health (DPH), which requires regular collection and testing of water samples to ensure that the quality meets regulatory standards and does not exceed Maximum Contaminant Levels (MCLs). Both the District and the Agency perform water quality testing, which has consistently yielded results within the acceptable regulatory limits. The District's Water Quality Division monitors water quality and provides supervision for water quality related issues.

The quality of the existing surface water supply sources over the next 25 years is expected to be adequate. Surface water will continue to be treated to drinking water standards, and no water quality deficiencies are foreseen to occur during the next 25 years. Table 5-6 summarizes the current and projected water supply changes due to water quality.

Table 5-6 (DWR Table 30)
Water quality — current and projected water supply impacts

Water source	Description of condition	2010	2015	2020	2025	2030	2035 - opt
Sonoma County Water Agency	None	0	0	0	0	0	0
Local Surface Water	None	0	0	0	0	0	0

Units (circle one): ***acre-feet per year*** *million gallons per year* *cubic feet per year*

5.3 Supply and Demand Comparisons

The supply compares the projected normal year water supply available to the District under a current multiple-dry water year condition; and a comparison of supply and demand from 2015 to 2035, in five-year increments.

Table 5-7 (DWR Table 31) Supply reliability — current water sources				
Water supply sources[1]	Average / Normal Water Year Supply[2]	Multiple Dry Water Year Supply[2]		
		Year 2011	Year 2012	Year 2013
Sonoma County Water Agency	9,182	9,182	9,182	9,182
Local Surface Water	2,500	2,500	2,500	2,500
Recycled Water	140	140	140	140
Total Supply	11,822	11,822	11,822	11,822
Percent of normal year:		100%	100%	100%

Units (circle one): ***acre-feet per year*** *million gallons per year* *cubic feet per year*

[1] *From Table 16.*

[2] *See Table 27 for basis of water type years.*

Table 5-8 (DWR Table 32) Supply and demand comparison — normal year					
	2015	2020	2025	2030	2035 - opt
Supply totals (from Table 16)	12,336	12,669	12,889	12,947	12,803
Demand totals (From Table 11)	11,642	11,577	11,629	11,568	11,336
Difference	694	1,092	1,260	1,379	1,467
Difference as % of Supply					
Difference as % of Demand	6.0%	9.4%	10.8%	11.9%	12.9%

Units are in ***acre-feet per year****.*

Table 5-9 (DWR Table 33) Supply and demand comparison — single dry year					
	2015	**2020**	**2025**	**2030**	**2035 - opt**
Supply totals[1,2]	10,927	11,151	11,164	11,164	11,164
Demand totals[2,3,4]	11,642	11,577	11,629	11,568	11,336
Difference	(715)	(426)	(465)	(404)	(172)
Difference as % of Supply	-6.5%	-3.8%	-4.2%	-3.6%	-1.5%
Difference as % of Demand	-6.1%	-3.7%	-4.0%	-3.5%	-1.5%

*Units are in **acre-feet per year**.*

[1] *Consider the same sources as in Table 16. If new sources of water are planned, add a column to the table and specify the source, timing, and amount of water.*

[2] *Provide in the text of the UWMP text that discusses how single-dry-year water supply volumes were determined.*

[3] *Consider the same demands as in Table 3. If new water demands are anticipated, add a column to the table and specify the source, timing, and amount of water.*

[4] *The urban water target determined in this UWMP will be considered when developing the 2020 water demands included in this table.*

Table 5-10 (DWR Table 34) Supply and demand comparison — multiple dry-year events						
		2015	2020	2025	2030	2035 - opt
Multiple-dry year first year supply	**Supply totals**[1,2]	12,118	12,451	13,004	13,545	12,585
	Demand totals[2,3,4]	11,642	11,577	11,629	11,568	11,336
	Difference	476	874	1,375	1,977	1,249
	Difference as % of Supply	3.9%	7.0%	10.6%	14.6%	9.9%
	Difference as % of Demand	4.1%	7.5%	11.8%	17.1%	11.0%
Multiple-dry year second year supply	**Supply totals**[1,2]	12,118	12,451	13,004	13,545	12,585
	Demand totals[2,3,4]	11,642	11,577	11,629	11,568	11,336
	Difference	476	874	1,375	1,977	1,249
	Difference as % of Supply	3.9%	7.0%	10.6%	14.6%	9.9%
	Difference as % of Demand	4.1%	7.5%	11.8%	17.1%	11.0%
Multiple-dry year third year supply	**Supply totals**[1,2]	12,118	12,451	13,004	13,545	12,585
	Demand totals[2,3,4]	11,642	11,577	11,629	11,568	11,336
	Difference	476	874	1,375	1,977	1,249
	Difference as % of Supply	3.9%	7.0%	10.6%	14.6%	9.9%
	Difference as % of Demand	4.1%	7.5%	11.8%	17.1%	11.0%

*Units are in **acre-feet per year**.*

[1]Consider the same sources as in Table 16. If new sources of water are planned, add a column to the table and specify the source, timing, and amount of water.

[2]Provide in the text of the UWMP text that discusses how single-dry-year water supply volumes were determined.

[3]Consider the same demands as in Table 3. If new water demands are anticipated, add a column to the table and specify the source, timing, and amount of water.

[4]The urban water target determined in this UWMP will be considered when developing the 2020 water demands included in this table.

5.4 Summary of Supply and Demand Analysis

The District's combined projected water supplies are sufficient to meet projected demands during normal and multiple-year conditions. During a severe drought condition, under the single-dry year scenario, the District will not have adequate supplies and will need to impose mandatory water use restrictions. The District's projected water supply portfolio is highly stable because it relies

largely on current contracted and permitted water supply from the Agency and also has local surface water that can further supplement the Agency supply, particularly during drought conditions.

By 2035, the Agency will need to "perfect" its water supply from the Russian River because the combined water demands from the water contractors and water customers of the Agency will exceed its current Russian River diversion limit.

5.5 Water Shortage Contingency and Drought Planning

This section provides information required by Water Code Section 10632. The District adopted a Water Waste Prohibition in 2000 through its Regulation 15, which is included in Appendix C. The District adopted a Water Shortage Contingency Analysis with its 2005 UWMP, which is summarized in this section.

5.5.1 Actions in Response to Water Supply Shortages (Water Code 10632(a))

Water Code Section 10632(a) requires a description of the actions to be undertaken by the urban water supplier in response to water supply shortages of up to 50 percent. This section also requires the water supplier to outline the specific water supply conditions that are applicable at each stage of action. The District has the authority to declare a water shortage emergency under Section 375 and 10632 of the Water Code and has developed a model resolution to exercise this authority, which is included in Appendix C. Emergencies are declared in three stages, with specific reduction methods used for each stage. Table 5-11(DWR Table 35) summarizes the consumption reduction methods that the District has the authority to use.

Table 5-11 (DWR Table 35)
Water Shortage Contingency — Rationing Stages to Address Water Supply Shortages

Stage No.	Water Supply Conditions	% Shortage
In effect at all times	Washing hard surfaced areas except as necessary to protect public health and safety	Waste of Water Prohibited
	Fix customers plumbing leaks within 72 hours	
	Control irrigation to prevent runoff or overspray	
	Washing vehicles and machinery with a hose not equipped with a shutoff nozzle	
	Water for non-recycling decorative fountains	
	Water for single pass evaporative cooling system for air conditioners	
	New non-recirculating conveyor car washes	
	Water for new non-recirculating industrial clothes wash systems	
1 Voluntary	All Prohibitions + 15% voluntary reduction	15%
	Minimization of non-essential uses	
	Use of garden or utility hose without shutoff nozzle	
	Irrigation limited to hours between 8pm and 6am	
2 Mandatory	All Prohibitions & Stage 1 Actions	30%
	Water-on-request restaurant programs	
	Prohibition against operating ornamental fountains	
	Prohibition against filling new and refilling swimming pools	
	Washing patios, sidewalks and other hard surfaces except by public safety officials	
	Prohibit potable water for dust control	
	Golf Course Irrigation with potable water at Tees and Greens only	
	All irrigation reduced by 30%	
3 Mandatory	All Prohibitions, Stage 1 & Stage 2 Actions	50%
	Prohibition against landscape installation for new construction except drought resistant authorized by the District	
	Golf Course Irrigation with potable water prohibited	
	Turf Irrigation prohibited	
	All other irrigation to be hand watered	
	Established gpcd maximum threshold for all customers to adhere 50% reduction	

[1] *One of the stages of action must be designed to address a 50 percent reduction in water supply.*

5.5.2 Minimum Water Supply During the Next Three Years (Water Code 10632(b))

The minimum water supply available during the next four years during a multiple year drought is shown in Table 5-7 (DWR Table 31) above. Because the District has based its planning on the Agency's current water rights and because these current water rights are more restrictive than any hydrologic condition, including the multiple-dry year condition, this minimum water supply analysis is identical to the normal water year analysis.

5.5.3 Catastrophic Supply Interruption Plan (Water Code 10632(c))

In accordance with the Emergency Services Act, the District has developed an Emergency Operation Plan (EOP). This EOP guides response to unpredicted catastrophic events that might impact water delivery including regional power outages, earthquakes, or other disasters. The EOP outlines standard operating procedures for all levels of emergency, from minor accidents to major disasters. The EOP has been coordinated with the Agency and neighboring water purveyors.

5.5.4 Prohibitions, Penalties and Consumption Reduction (Water Code 10632 (d)-(f))

Regulation 15 specifies permanent prohibited water uses. The District's Urban Water Shortage Contingency Plan includes temporary prohibitions that are used in various stages of the water shortage emergencies. These are outlined in Table 5-12 (DWR Table 36).

Table 5-12 (DWR Table 36) Water Shortage Contingency- Mandatory Prohibitions	
Examples of Prohibitions	**Stage When Prohibition Becomes Mandatory**
Using potable water for street washing	Permanent Prohibition
Escape of water through breaks/leaks in customer plumbing	Permanent Prohibition
Excessive irrigation runoff or overspray	Permanent Prohibition
Washing vehicles and machinery with a hose without a shutoff nozzle	Permanent Prohibition
Non recycled water fountains	Permanent Prohibition
New single pass evaporative cooling systems	Permanent Prohibition
New non-recirculating car washes	Permanent Prohibition
New non-recirculating industrial clothes wash systems	Permanent Prohibition
Service of water in restaurants except upon request	Stage 2
Use of any hose without a shutoff nozzle	Stage 1
Irrigation between 6am and 8pm	Stage 1
Operating ornamental fountains	Stage 2
Filling new and refilling existing swimming pools	Stage 2
Washing sidewalks and patios	Stage 2
Landscape Installation for new construction	Stage 3
Turf Irrigation	Stage 3
All other irrigation hand watered	Stage 3

Table 5-13 (DWR Table 38) Water Shortage Contingency — Penalties and Charges	
Penalty or Charge	**Stage When Penalty Takes Effect**
Written Notice with time frame for correction	Any Stage
Personal contact with follow up written notice	Any Stage
Installation of flow restricting device	Any Stage
Imposition of water waste fees	Any Stage
Disconnection of service	Any Stage

5.5.5 Effect on Revenues and Expenditures (Water Code 10632 (g))

Based on the analysis presented above, the most challenging situation for the District to manage would be a 50 percent reduction in all supplies, which would require the District to employ demand management techniques that achieve 50 percent reduction in water delivered. When water deliveries are reduced, the District also experiences reduced revenue from water sales.

This reduced revenue would be balanced by some reduction in costs, since the District would be purchasing less water from the Agency. In addition the District would have the option of deferring planned capital expenditures and utilizing its utility system reserves. The District manages its Water Enterprise Fund to maintain cash reserves including a dedicated $1,000,000 reserve for emergencies. The District's current 5-year financial plan predicts Fiscal Year (FY) 2010-11 total reserve balance of $4,900,000.

The District monitors and reports on its reserve balance monthly in order to assure that reserve funding remains available to manage unanticipated reductions in demand.

5.5.6 Water Shortage Contingency Ordinance (Water Code 10632(h))

The District has adopted a Water Waste Ordinance through Regulation 15. It has developed a model resolution which can be used to declare a shortage emergency and stages of actions.

5.5.7 Mechanisms for Determining Actual Reductions (Water Code 10632 (i))

The District's local surface water supply and Agency supply turnouts are all equipped with water meters. In addition, each potable water customer is metered. Non-residential landscape irrigation is metered separately from indoor use at most non-residential sites. The District reads meters on a bimonthly basis and is able to document both demand reductions and a typically high water use. The District contacts individual customers to resolve issues related to a typically high water use.

SECTION 6

WATER CONSERVATION

This section provides a description of the District's Water Conservation Program and Best Management Practices (BMPs) or Water Demand Management Measures (DMMs). BMPs and DMMs correspond and are referred to interchangeably. The District utilizes water conservation BMPs as a method to reduce water demands, thereby reducing water supply needed for the District. This section also discusses the District's preparations for a water shortage or supply interruption.

6.1 BMP Implementation

The District is a member of the California Urban Water Conservation Council (CUWCC). The CUWCC was created to assist in increasing water conservation statewide, under a Memorandum of Understanding (MOU). As signatory to the MOU, the District has pledged its good faith effort towards implementing BMPs identified in the CUWCC MOU Regarding Urban Water Conservation. The two primary purposes of the MOU are as follows:

a. to expedite implementation of reasonable water conservation measures in urban areas; and

b. to establish assumptions for use in calculating estimates of reliable future water conservation savings resulting from proven and reasonable conservation measures. Estimates of reliable savings are the water conservation savings that can be achieved with a high degree of confidence in a given service area.

The District signed the CUWCC MOU on July 5, 2001 and submits annual BMP reports to the CUWCC in accordance with the MOU. The MOU requires that a water utility implement only the BMPs that are economically feasible. If a BMP is not economically feasible, the utility may request an economic exemption for that BMP. The District has not requested economic exemption from any of the BMPs at this time and currently implements all of the BMPs. Table

6-1 identifies the CUWCC's BMPs, the correlating Demand Management Measure number and a summary description of the program that the District implements.

Table 6-1 CUWCC BMP and North Marin Water District (NMWD)
Water Conservation Program
Summary Description Table

BMP #	DMM #	Measure	NMWD Program Summary Description
1.1.1	L	Conservation Coordinator	NMWD employs a Water Conservation Coordinator to implement the Water Conservation and Public Outreach Programs.
1.1.2	M	Water Waste Prevention	NMWD enforces a strict water waste prevention/prohibition regulation (NMWD Regulation 15).
1.1.3	J	Wholesale Agency Assistance	NMWD is not a wholesale agency
1.2	C	Water Loss Control	NMWD implements water loss control measures and audits in compliance with the CUWCC requirements
1.3	D	Metering with Commodity Rates	All connections are metered in the NMWD Service Areas
1.4	K	Retail Conservation Pricing	NMWD bills customers using a three-tier rate system for residential accounts and a seasonal rate (increase in summer months) for non-residential accounts.
2.1	G	Public Information Program	NMWD implements a full scale public information program including newsletters, bill stuffers, newspaper advertisements, public outreach events, and other programs.
2.2	H	School Education Programs	NMWD receives wholesale program assistance from Sonoma County Water Agency to implement the school education program
3.1	A, B	Residential Assistance Program	1) Through the Water Smart Home Survey Program, NMWD provides surveys of all indoor fixtures and appliances for existing single-family and multi-family residential customers. 2) NMWD provides free plumbing fixtures to customers, via both NMWD programs and contracted energy and water efficiency outlets that include low-flow showerheads, faucet aerators, and toilet tank retrofit devices.

BMP #	DMM #	Measure	NMWD Program Summary Description
3.2	A	Landscape Water Survey	Through the Water Smart Home Survey Program, NMWD provides free outdoor landscape irrigation surveys for existing single-family and multi-family residential customers.
3.3	F	High Efficiency Clothes Washing Machine Financial Incentive Programs	NMWD rebates customers for purchase of qualified high efficiency clothes washing machines.
3.4	N	Water Sense Specification Toilets	NMWD rebates customers for purchase and installation of qualified Water Sense Certified High Efficiency Toilets
4	I	Commercial, Industrial, Institutional (CII)	NMWD offers CII customers audits to identify water efficiency measures, offers customers free fixtures and offers rebates on qualified high efficiency toilets and appliances.
5	E	Landscape	1) All public and private irrigators of landscapes are eligible for free landscape water audits upon request. 2) Over 90% of all irrigators of landscapes with separate irrigation accounts receive a monthly or bi-monthly irrigation water use budget.

The District conducted a water conservation program analysis as a part of the MWM analysis - *Final 2010 Urban Water Management Plan Water Update Analysis and Water Conservation Measures Update* (Appendix B). This analysis calculated the range of conservation savings and costs for the years 2010 through 2035 through different options of implementation. Also included in the analysis were conservation programs that go above and beyond the BMPs/DMMs and new development water efficiency requirements/measures which the CUWCC now recognizes through the flex-track reporting option.

Urban water suppliers that are members of the CUWCC may submit their most recent BMP Annual Report for reporting years 2009-10 to meet the requirements of DWR Water Code Section 10631 (f). Since the BMPs changed in 2008 to reflect the flex-track and GPCD options, the reporting requirements changed for 2009/2010. The Foundational BMPs (BMPs 1.11 through 2.2) need to be implemented and reported very similar to previous BMP reporting; however, the Programmatic BMPs (BMPs 3.1 through 5) can be reported traditionally, or

through a flex-track method using water savings calculations of other or additional conservation programs, or through a GPCD format (Gallons per Capita Per Day pursuant to SBx7-7, The Water Conservation Act of 2009). For the Programmatic BMPs, the District has reported to CUWCC using the GPCD option for 2009/2010.

On June 16, 2011, the District received the CUWCC BMP Retail Coverage Reports for 2010, showing the District to be "on track" (compliant) with all of the BMPs (Coverage Reports are included in Appendix C). Also, the District has included 2010 Foundational BMP database entry sheets (supplied by CUWCC), 2010 CUWCC GPCD Compliance Calculator Report page for Programmatic CUWCC BMP Compliance, and the District CUWCC BMP compliance certification memorandum (all included in Appendix C).

The District is also an active member of the Sonoma-Marin Saving Water Partnership (Partnership), established regionally with nine other local retail water utilities and Sonoma County Water Agency, with a goal to identify, recommend and fund implementation of water conservation projects, facilitate regional water use efficiency public outreach campaigns and to maximize the cost-effective projects in Sonoma and Marin Counties. The Partnership recognizes that establishing common Water Conservation Projects on a regional basis and applicable across the political and jurisdictional boundaries of each Partner may be a means of cost effectively conserving more water than would otherwise be conserved on an individual agency-by-agency basis. The Partnership establishes minimum water conservation funding requirements for each of the members, and members are also committed to remain as members in good standing of the CUWCC, implement the BMPs as specified in the MOU, implement water conservation programs that go beyond the BMPs requirements, and enforce strict new development water use efficiency standards.